REMARKS

Claims 1-6 are pending.

Claims 1-5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over DE 3300865 to Puetter (hereinafter DE '865) in view of U.S. Patent No. 5,435,830 to Senda et al. (hereinafter Senda). The Office Action asserts that DE '865 teaches a process for the production of aqueous $TiCl_3$ solution by cathodic electrolytic reduction of $TiCl_4$ solution in a cell. The Office Action asserts that DE '865 teaches controlling the conversion percentage for $TiCl_3$ solution under different conditions, which reads on the claimed predetermined existing ratio of trivalent titanium ions and tetravalent titanium ions. The Office Action acknowledges that DE '865 does not explicitly teach producing fine metal powder having a particle diameter corresponding to the existing ratio of the trivalent titanium ions and the tetravalent titanium ions. The Office Action relies on Senda in an attempt to cure the deficiencies of DE '865.

The Examiner avers that the metal reduction for the fine metal powder depends on the amount of trivalent titanium ions. The Examiner contends that the fine metal powder has no direct relation with tetravalent titanium ions. The Examiner concludes that the particle diameter and the ratio of $TiCl_3$/ $TiCl_4$ is the same as the relationship between particle diameter and amount of $TiCl_3$ in solution. The Office Action states that the amount of $TiCl_3$ is a result-effective variable in terms of diameter of metal particles, which is evidenced by Senda.

The Examiner is directed to MPEP § 2144.05(II)(B) under the heading "Only Result-Effective Variables Can Be Optimized," which sets forth the applicable standard for determining result-effective variables:

> A particular parameter must first ***be recognized*** as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might

> be characterized as routine experimentation. (citing *In re Antonie*, 195 USPQ 6 (CCPA 1977)) (emphasis added).

In rejecting a claim under 35 U.S.C. § 103, the Examiner is required to discharge the initial burden by, *inter alia*, making **"clear and particular"** factual findings as to a **specific understanding** or **specific technological principle** which would have **realistically** impelled one having ordinary skill in the art to modify an applied reference to arrive at the claimed invention based upon facts, -- not generalizations. *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 57 USPQ2d 1161 (Fed. Cir. 2000); *Ecolochem Inc. v. Southern California Edison, Co.*, 227 F.3d 1361, 56 USPQ2d 1065 (Fed. Cir. 2000); *In re Kotzab*, *supra*; *In re Dembiczak*, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999). That burden has not been discharged, as the Examiner has provided no factual basis for modifying the particle diameter corresponding to the existing ratio of trivalent titanium ions and the tetravalent titanium ions, as required by claim 1.

It is well known by persons skilled in the art that the relationship between the particle diameter and the ratio of $TiCl_3$/ $TiCl_4$ is *different* from the relationship of the particle diameter and the amount of $TiCl_3$ in solution. Senda does not describe or infer a solution containing ***both*** trivalent titanium ions and tetravalent titanium ions. Senda discusses a reducing agent solution **only** containing trivalent titanium ions, not a solution of ***both*** trivalent and tetravalent titanium ions. Senda is *silent* regarding reducing parts of the tetravalent titanium ions to trivalent titanium ions, as required by claim 1. Ergo, a fine metal powder having a particle diameter corresponding to the existing ratio of trivalent titanium ions and tetravalent titanium ions is not the final product of Senda, and therefore, such nonexistent reducing agent solution containing ***both*** the trivalent titanium ions and the tetravalent titanium ions can not possibly have the predetermined existing ratio, as required by claim 1.

According to the claimed subject matter per claim 1, the particle diameter of the fine metal powder corresponds to the existing ratio of the trivalent titanium ions and the tetravalent titanium ions. In contradistinction to the present invention, Senda adds titanium trichloride to an aqueous solution to form a metal powder. In addition, the present invention addresses the problems resulting from adding titanium trichloride to an aqueous solution (*see, e.g.,* pg. 6, line 16 – pg. 7, line 15 of the originally filed specification). Specifically, in the present invention, the trivalent titanium ions grow the fine metal powder by reducing and depositing ions of the metal element, while simultaneously the tetravalent titanium ions restrain the growth of the same fine metal powder (*see, e.g.,* pg. 9, line 2-pg. 10, line 2 and Fig. 1 of the originally filed specification).

Assuming arguendo, if the particle diameter of the fine metal powder is determined ***only*** by the amount of the trivalent titanium ions, a graph showing the relationship between the ion concentration (%) of the trivalent titanium ions and the average particle diameter (nm) of the fine metal powders must have a linear shape, **not** a curved shape that is shown in Fig. 1. However, in Fig. 1, the average particle diameter of the fine metal powders varies in a downward curved shape, *not in a linear shape*, when the ion concentration of the trivalent titanium ions is in the range of 0% to 50%, for example. In this range, the tetravalent titanium ions, whose existing amount is much higher than that of the trivalent titanium ions in the system, function to restrain the growth of the fine metal powders. Thus, the particle diameter of the fine metal powder corresponds to the existing ratio of the trivalent titanium ions ***and*** the tetravalent titanium ions.

Because Senda discusses the growth of metal powders ***in the absence of tetravalent titanium ions***, Senda fails to disclose or suggest, at a minimum, "...**subjecting a solution containing tetravalent titanium ions** having a pH of not more than 7 to cathode electrolytic

treatment **to reduce parts of the tetravalent titanium ions to trivalent titanium ions, to obtain a reducing agent solution containing both the trivalent titanium ions and the tetravalent titanium ions at a predetermined existing ratio**; and adding a water-soluble compound of at least one type of metal element forming the fine metal powder to the reducing agent solution, followed by mixing, **to reduce and deposit ions of the metal element by the reducing action at the time of oxidation of the trivalent titanium ions to the tetravalent titanium ions to grow the fine metal powder, and at the same time, to restrain the growth of the fine metal powder by the tetravalent titanium ions, thereby to obtain a fine metal powder having a particle diameter corresponding to the existing ratio of the trivalent titanium ions and the tetravalent titanium ions,**" as recited in claim 1. Senda does not cure the deficiencies of DE '865.

As DE '865 and Senda do not disclose the same method of producing a fine metal powder as disclosed by the present inventors, and even if combined still fail to disclose or suggest the elements recited by claim 1, the combination of DE '865 and Senda do not render the method of producing a fine metal powder as recited by claim 1 obvious.

Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge readily available to one of ordinary skill in the art. *In re Kotzab*, 217 F.3d 1365, 1370 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). There is no suggestion in Senda to add tetravalent titanium ions to trivalent titanium ions to form a fine metal powder, or to modify the existing ratio of the trivalent titanium ions and the tetravalent titanium ions to correspond to a

particle diameter of the fine metal powder, nor does common sense dictate the Examiner-asserted modifications. The Examiner has not provided any evidence that there would be any obvious benefit in making the asserted modification of Senda. *See KSR Int'l Co. v. Teleflex, Inc.*, 127 S.Ct. 1727, 82 USPQ2d 1385 (2007).

The only teaching of the process of forming a fine metal powder by subjecting a solution of tetravalent titanium ions to trivalent titanium ions and the claimed particle diameter is found in Applicants' disclosure. However, the teaching or suggestion to make a claimed combination and the reasonable expectation of success must not be based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Claim 6 is rejected under 35 U.S.C. § 103(a) as being unpatentable over DE '865 in view of Senda, and further in view of U.S. Patent No. 5,409,581 to Harrison et al. (hereinafter Harrison).

Dependent claim 6 is allowable for at least for the same reasons as independent claim 1, and further distinguishes the claimed method of producing a fine metal powder.

Conclusion

In view of the above remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Response or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper,

including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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